

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) A ROLLER MILL OF THE EDGE RUNNER TYPE

(71) I, HORST BRUNDIEK, a German, Citizen, of Rubensstrasse 26, 4044 Kaarst, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to an edge runner type roller mill, and more particularly to such a mill with three rolls, in the case of which the rolls are adapted to cooperate with a rotary grinding table under spring or hydraulic loading pressure and a ring, arranged above the grinding rolls to hold the rolls. A disadvantage with known edge runner type roller mills is that the system is tied to the use of three rolls so that the rolls make proper engagement with an even distribution of pressing forces. Accordingly as a result the dimensions of such a roller mill are limited for economic reasons because the rolls cannot for economic reasons exceed a certain size. Furthermore, it is difficult to control bearing pressures in the case of very large rolls.

One aim of the present invention is that of developing a construction, using the three roll system, which allows an increase in size of the mill while observing economic limits, so that the capacity can be increased without unduly increasing the amount of space required.

Accordingly I provide an edge runner type roller mill comprising three rolls adapted to cooperate with a grinding table, spring or hydraulic loading means for the rolls, a first loading ring arranged above the rolls for applying force to the rolls, a pressing rig for holding down the said first loading ring, a second loading ring arranged above or below the first loading ring for loading three further rolls alternating with the first-mentioned rolls and adapted with them to operate with the grinding table. In the case

of a preferred embodiment of the invention there is the feature that the inner parts of the two loading rings are arranged immediately one above the other, while one loading ring has recesses on its outer side, whose depth is approximately twice the thickness of the two loading rings together on the inner side, the other loading ring having projections extending into the recesses in a complementary manner to fill the recesses.

Such a construction offers the possibility of using two roll systems with six rolls in all while using the same basic constructional units. Thus, while using the same type of rolls and roll bearing units, which are expensive, a substantially larger type of mill can be constructed.

The figures of the accompanying drawings show by way of example two embodiments of the invention.

Figure 1 shows diagrammatically a side elevation of an edge runner type roller mill having guide rings or loading rings subjected to spring pressure.

Figure 2 shows a similar view of a second embodiment the guide or loading rings being acted upon by hydraulic pressure.

Figure 3 shows diagrammatically in plan view the arrangement of the loading rings.

Figure 4 shows a plan view of the arrangement of the two roll systems.

Figure 5 shows the arrangement and construction of the two-loading rings and their matching configuration.

Referring now to Figure 1 the main conventional parts of an edge runner type roller mill are seen to comprise grinding rolls 2, 6 which are acted upon by levers 3 and 7. The grinding rolls 2 and 6 run on a rotating grinding table 17, which is driven via a drive 18 and a drive shaft 19.

It is to be noted in this respect that each of the rolls 2 belongs to a system 1 co-operating with the loading ring 5, which is connected with the lever 3 provided with

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a ball 4. Each of the rolls 6 belongs to a system 2 cooperating with the loading ring 9, with which the lever 7 is connected in an articulating manner, for example by means 5 of a ball 8. The pressing force acting on the loading rings 5 and 9 is exerted by a pressing ring 10, which is connected via springs 28 with the rings 5 and 9 of systems 1 and 2. The pressing ring 10 is held by 10 members 11 and 12, which via a ball joint 15 and 16 act on the pressing ring 10 and which are supported underneath by articulating bearing means 13 and 14. The members 11 and 12 are in effect pulling rods. 15 The embodiment shown in figure 2 which only serves to show the differently constructed parts has an oil pressure cylinder 20 on the end of the pulling rod 12. The oil pressure cylinder 20 is supplied with oil 20 under pressure by a supply line 20'. The articulated bearing means 14 underneath the oil pressure cylinder 20 is in principle the same as that previously described.

Referring now to Figure 3 the loading 25 ring 5 belongs to system 1 and the loading ring 9 to system 2.

In Figure 4 grinding rolls 2 belong to system 1 and correspondingly the grinding rolls 6 belongs to system 2.

30 Figure 5 shows in the upper drawing the two loading rings 5 and 9, whose inner parts 23 and 26 are arranged immediately above one another. From the lower drawing it can be seen that the loading ring 5 of system 35 1 has projections 21 extending into recesses 24 of the loading ring 9 which belongs to system 2. The construction is furthermore so designed that the projections 21 have their side faces 22 lying directly against 40 the side faces 25 of the recesses 24.

It can be readily seen that the arrangement described with the loading rings 5 and 9 can in principle be duplicated by using

three loading rings instead of two loading rings so that three rings with in all nine 45 rolls would result. At the present state of milling technology, however, an overall number of six rolls appears to be sufficient for success.

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WHAT I CLAIM IS:—

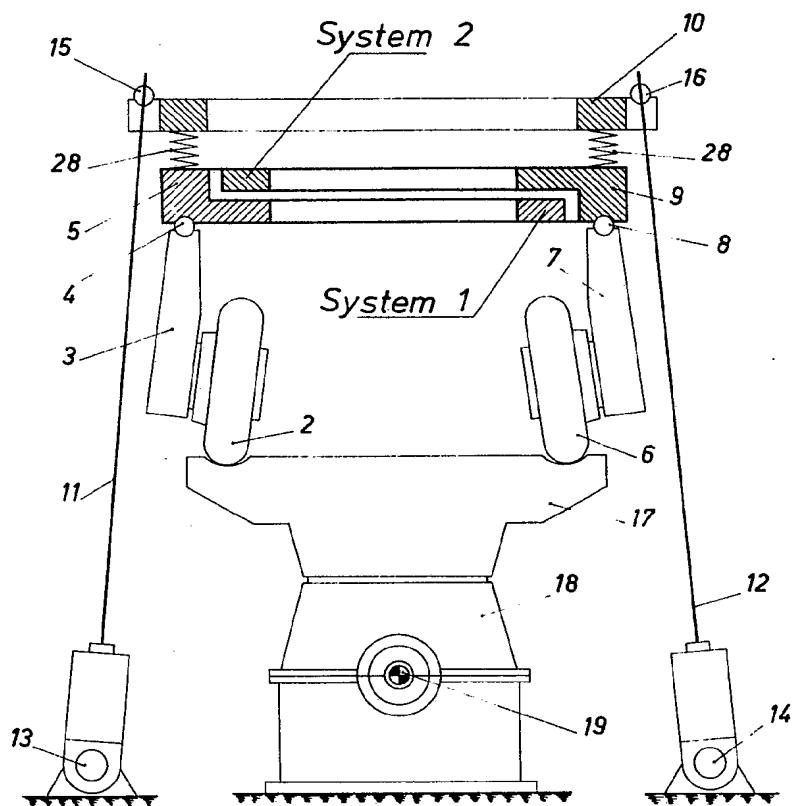
1. An edge runner type roller mill comprising three rolls adapted to cooperate with a grinding table, spring or hydraulic loading means for the rolls, a first loading ring 55 arranged above the rolls for applying force to the rolls, a pressing ring for holding down the said first loading ring, a second loading ring arranged above or below the first-loading ring for loading three further rolls 60 alternating with the first-mentioned rolls and adapted with them to cooperate with the grinding table.

2. An edge runner type roller mill in accordance with claim 1, in which the inner 65 parts of the two loading rings are arranged immediately one above the other, while one loading ring has recesses on its outer side, whose depth is approximately twice the thickness of the two loading rings together 70 on the inner side, the other loading ring having projections extending into the recesses in a complementary manner to fill the recesses.

3. An edge runner type roller mill in 75 accordance with claim 1, substantially as described above, with reference to, and as illustrated in the Figures of the accompanying drawings.

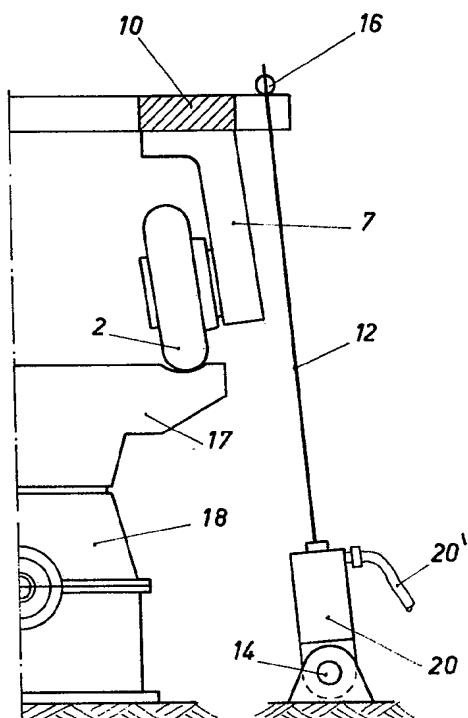
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Fig. 1



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 Sheet 2

Fig. 2



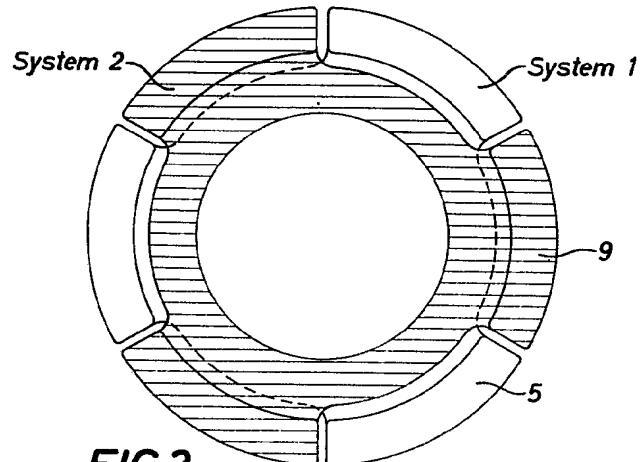


FIG.3.

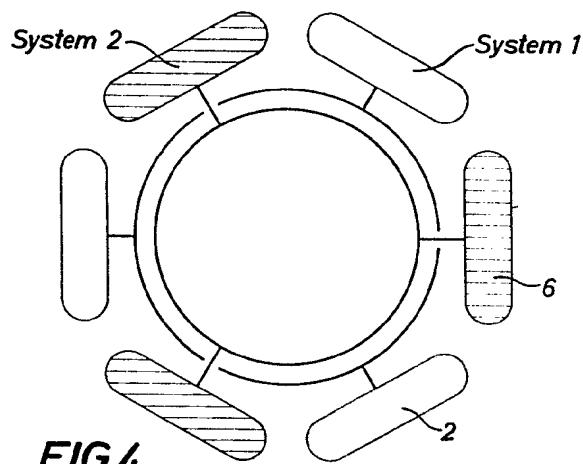


FIG.4.

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Fig. 5

